REMARKS

Claims 9-26 are pending in the application.

By the foregoing Amendment, new claims 18-26 are added, of which claim 18 is independent and claims 19-26 depend directly or indirectly from claim 18. New claim 18 is the same as claim 9, with an additional limitation to more clearly define the optical interface. Dependent claims 19-26 recite the same limitations as claims 10-17, respectively. These changes are believed not to introduce new matter, and entry of the Amendment is respectfully requested.

Based on the above Amendment and the following Remarks, Applicant respectfully requests that the Examiner reconsider all outstanding rejections, and withdraw them.

Rejections under 35 U.S.C. § 103

1. Claims 9-14

In paragraph 4 of the Office Action, claims 9-14 were rejected under section 103(a) as being unpatentable over Bokor et al. in view of La Fontaine et al. This rejection is respectfully traversed as being based upon references that, either alone or in combination, do not teach or suggest the claimed invention.

As stated in the Office Action Bokor et al. discloses an apparatus for inspecting a mask (10) comprising a vacuum chamber (30), illuminating means for illuminating a mask with EUV radiation but does not disclose converting means for converting the EUV radiation in radiation of a longer wavelength nor a sensor for recording an image in the radiation of a longer wavelength. The Office Action recognizes that Bokor et al. does not teach converting means for an image in radiation of a longer wavelength; and cites La Fontaine et al. as supplying this teaching. The Office Action does

not address Bokor et al.'s teaching with respect to the claim 9 limitation of "sensor means for recording the image in the radiation of a longer wavelength, the sensor means being disposed outside the vacuum chamber."

As disclosed by Bokor et al., the EUV radiation is detected by a channeltron electron multiplier, which is arranged inside the same vacuum chamber as the illuminating means. It is well known that a channeltron electron multiplier only works in a vacuum environment (see e.g. *http://www.sisweb.com/ms/galileo/galileo1.htm#description*, a printout of which is attached hereto as an Appendix). Therefore, moving Bokor et al.'s sensor means (the channeltron electron multiplier) so that it is disposed outside the vacuum chamber, as required by claim 9, would render Bokor et al.'s apparatus inoperable for its intended purpose.

It is well-settled that the mere fact that the prior art can be modified "should not have made the modification obvious unless the prior art suggested the desirability of the modification," and that a modification which would render the prior art apparatus inoperable for its intended purpose does not establish a prima facie case of obviousness. *In re Gordon*, 221 USPQ 1125, 1127 (Fed. Cir. 1984) (citing *In re Imperato*, 179 USPQ 730, 732 (CCPA 1973) and *In re Schulpen*, 157 USPQ 52, 55 (CCPA 1968)).

As it would be improper to modify Bokor et al. to move the sensor means outside the vacuum chamber, it is irrelevant whether La Fontaine et al. teaches converting means as stated in the Office Action. The combination of Bokor et al. and La Fontaine et al. does not establish a prima facie case of obviousness.

The Office Action characterizes La Fontaine et al. as teaching "sensor means (70) for recording the image in the radiation of a longer wavelength ... and an optical interface (10) from the chamber (14) to the sensor means (detector)..." The Office Action does not address the claim 9

limitation of "the sensor means being disposed outside the vacuum chamber." It also glosses over the claim 9 limitation that the optical interface is from the *vacuum chamber* to the sensor means.

La Fontaine et al. discloses different embodiments of fluorescent imaging apparatus including a converter means for converting the EUV radiation into radiation of a longer wavelength and sensor means for detecting the longer wavelength.

The embodiments illustrated in La Fontaine et al.'s Figures 1 and 2 are oil immersion microscopes. A phosphor element 10 is used as converter means, and the long wavelength image is projected through barrel 14 to be processed by, e.g., a video camera as a sensor means. However, barrel 14 is not a vacuum chamber; it is merely a barrel connecting the converter and the sensor.

The embodiment illustrated in La Fontaine et al.'s Figure 5 is a fluorescent microscope 50, which is used to show an aerial image 51 created by a DEUV or EUV projection camera 52. A phosphor/lens element 53 is used to convert short wavelength images of a test mask into longer wavelength optical images.

In the embodiment shown in La Fontaine's Figure 6, a mask 60 is being inspected for defects using x-ray radiation to form the initial short-wavelength image. Fluorescent element 66 is used to convert the EUV radiation into radiation of a longer wavelength, and a detector 70 is used to detect the longer wavelength.

La Fontaine et al. does not teach or suggest a vacuum chamber in connection with any of the embodiments. Therefore, La Fontaine et al., like Bokor et al., does not each "sensor means for recording the image in the radiation of a longer wavelength, the sensor means being disposed outside the vacuum chamber" as required by claim 9.

Claim 9 also requires "an optical interface from the vacuum chamber to the sensor means." As the sensor means in Bokor et al. is inside the vacuum chamber, Bokor et al. does not provide an

optical interface therebetween. La Fontaine et al. does not teach or suggest any use of a vacuum chamber. Therefore, La Fontaine's apparatus would not have any need for an optical interface from a vacuum chamber to the sensor means; and in fact, La Fontaine et al. does not have any teaching that any part of the apparatus is used as an optical interface from a vacuum chamber to the sensor means. Therefore, Bokor et al. and La fontaine et al., either alone or in combination, cannot teach or suggest "an optical interface from the vacuum chamber to the sensor means" as required by claim 9.

In view of the foregoing, it is respectfully submitted that the invention as recited in claim 9 and claims 10-14 depending therefrom is patentable over Bokor et al. in view of La Fontaine et al.; and that the rejection should be withdrawn.

2. Claims 15-17

In paragraph 5 of the Office Action, claims 15-17 were rejected under section 103(a) as being unpatentable over Bokor et al. in view of La Fontaine et al., and further in view of Brunner et al. This rejection is respectfully traversed as being based upon references that, either alone or in combination, do not teach or suggest the claimed invention.

In the Office Action, Brunner et al. was cited as teaching two lens groups (a microscope objective wherein the imaging optic means includes first and second lens groups). Assuming for the sake of argument that this characterization is correct, Brunner et al. does not remedy the deficiencies of Bokor et al. in view of La Fontaine et al., inasmuch as Brunner et al. does not teach or suggest either "sensor means for recording the image in the radiation of a longer wavelength, the sensor means being disposed outside the vacuum chamber" or "an optical interface from the vacuum chamber to the sensor means," as required by claim 9, from which claims 15-17 depend. Therefore,

the combination of Bokor et al., La Fontaine et al., and Brunner et al. cannot teach or suggest the invention as recited in claims 15-17; and the rejection should be withdrawn.

New Claims 18-26

As new claim 18 recites all the limitations of claim 9, it is respectfully submitted that claim 18 is patentable over the prior art of record for the same reasons as stated above with respect to the rejection of claim 9. Further, claim 18 recites"the optical interface being arranged as a vacuum window in the vacuum chamber." This feature also is not taught or suggested by the prior art of record. Therefore, it is respectfully that the invention as recited in new claims 18-26 is patentable over the prior art of record.

Conclusion

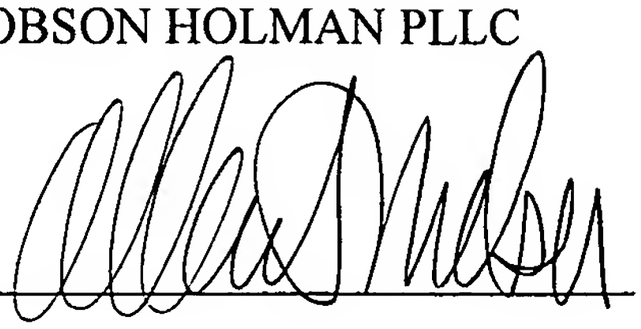
All rejections have been complied with, properly traversed, or rendered moot. Thus, it now appears that the application is in condition for allowance. Should any questions arise, the Examiner is invited to call the undersigned representative so that this case may receive an early Notice of Allowance.

Favorable consideration and allowance are earnestly solicited.

Respectfully submitted,

JACOBSON HOLMAN PLLC

Date: February 1, 2008

By: 

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Appendix: **Printout of http://www.sisweb.com/ms/galileo/galileo1.htm#description**
Petition for extension of time
Credit card payment form

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:	:	
	:	
Hans-Juergen DOBSCHAL	:	Confirmation No. 8295
	:	
Application No. 10/554,048	:	TC/Art Unit: 2884
	:	
Filed: October 24, 2005	:	Examiner: Fani Polyzos Boosalis
	:	
For: ARRANGEMENT FOR INSPECTING OBJECTS, ESPECIALLY MASKS IN MICROLITHOGRAPHY	:	Atty Docket: P70853US0

APPENDIX TO RESPONSE TO AUGUST 1, 2007 OFFICE ACTION

(PRINTOUT OF WEB PAGE AT
***http://www.sisweb.com/ms/galileo/galileo1.htm#description*)**

Burle Channeltron Electron Multipliers

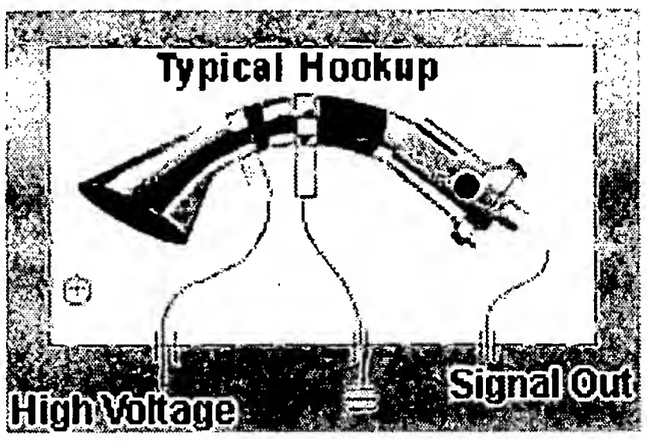
Mass Spec
Overview
MS Parts
- Calibration Compounds
- Cleaning Supplies
- FAB Accessories
- Filaments
- Filament Wires
- Heaters
- Multipliers
- Probes
- PRT Sensors
- Separators
- Service Parts
- Thermocouples

MS Repair
- Custom Services
- Filament Repair
- Source Cleaning

Supplies by MS
- Thermo Finnigan
- Agilent
- Extrel
- JEOL
- Kratos
- Nermag
- Perkin Elmer
- Varian Saturn
- Vestec
- VG

Probes from SIS
- SIS AutoProbe
- HPP7 Direct Insertion (HP5973)
- Direct Insertion

- Description of Channeltron Electron Multipliers
- Installation and Use of Channeltron Detectors
- Burle Multiplier Handbook
- Reference Literature on Electron Multipliers
- Warranty



Features:

- High Sensitivity
- Stable Glass Surfaces
- High Gain
- Reliability
- Value
- Long life

Applications:

- Mass Spectrometry
- Electron Microscopy
- Surface Analysis
- Field Ion Microscopy
- X-Ray Spectroscopy
- UV Spectroscopy

Channeltron electron multipliers detect and amplify a wide variety of electro-magnetic phenomena such as UV and X-ray photons, positive and negative ions, electrons and assorted molecular or sub-atomic particles. Burle detectors have widespread usage in applications as diverse as environmental analysis, surface analysis, pharmaceutical analysis, general laboratory spectroscopy, high-energy physics and space exploration.

Analytical instrumentation of many types contain Burle Channeltron Electron Multipliers, including: soft X-ray spectrometers, VUV spectrometers, magnetic sector and quadrupole mass spectrometers. Channeltron Electron Multipliers are the detectors of choice for scientists and scientific equipment manufacturers worldwide. High-performance applications demand high detector sensitivity, reliability, value and long useful life. Channeltron Electron Multipliers deliver high performance. Burle multipliers are the preferred multiplier for mass spectrometer use. In-house glass production, materials research and applications engineering allow Galileo to test the limits in custom design and fabrication. A 100% test and inspection policy guarantees customers the highest quality and most reliable detectors available in the world.

(HP5989)
- **High Temperature**
- **Calibration Gas**
- **DCI/DEP**
- **Line of Sight**
- **Custom for TSQ and Other Instruments**
- **HP Inlet with Automatic Stops**

Library and Resources

- **Mass Spec Tools**
  - **Isotopic Distribution Calc/Plotter**
  - **Element Mass/Isotope Numbers**
  - **more...**

SIS Catalog Online

See also the following sections of our catalog:

- **A. General MS Supplies**
- **B. Supplies for Specific Models of MS**

4700 Series

These high-current detectors are designed for use in the analog current measuring mode. Designed to reach high performance at >25µA bias current, the 4700 Series detectors are the most widely used quadrupole mass spectrometer detectors in the world. Channeltron® 4700 Series detectors are available mounted in ceramic housings and are bakeable to 350 degrees C.

4800 Series

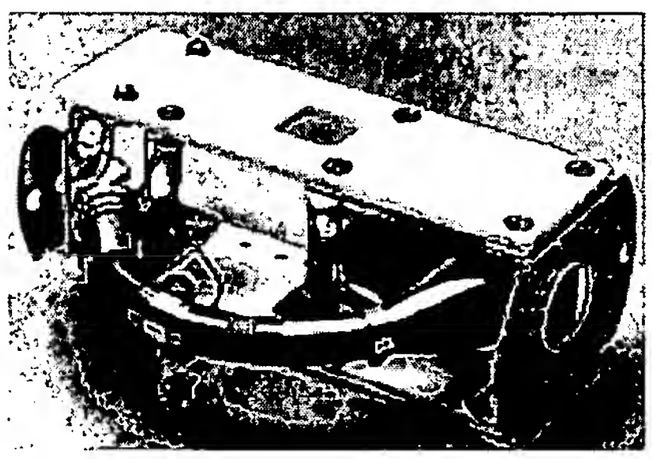
These high-current/high gain detectors are designed for use in either pulse-counting or analog mode. Typically, a 4800 Series detector has 10X higher gain than 4700 Series detectors and an output pulse height distribution of less than or equal to 75% FWHM. The 4800 Series are available mounted in ceramic housings and are bakeable to 350 degrees C.

5700 Series

These are the new high performance detectors for mass spectrometers. They are designed for higher sensitivity, extended dynamic range and longer detector life.

Parameters	Analog	Pulsed
1. Pulse Width	-	18-20 nSec
2. Rise Time	-	3-5 nSec
3. Dark Count Rate	<.05 cps	<.05 cps
4. Linerarity	~10% of bias current	-
5. Bias Current	25-46µA	15-35µA
6. Maximum Count Rate	-	10^7 cps
7. Gain @ 3000V	$>10^7$	$>10^8$
8. FWHM	-	<75%

Burle Multipliers in stock for immediate shipment

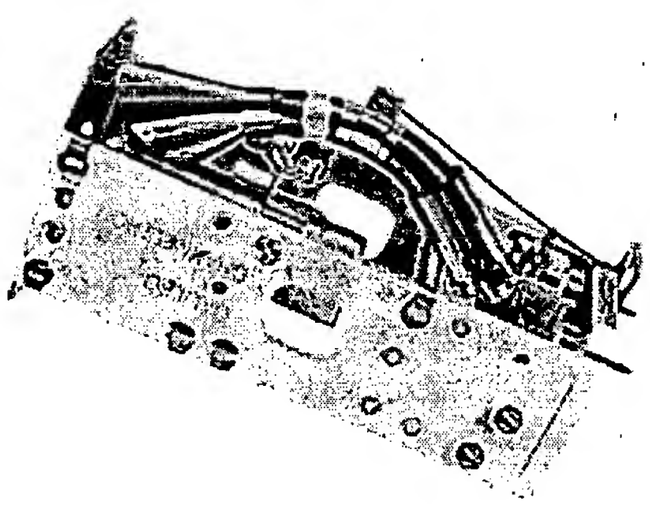


T he Burle Continuous Dynode Electron Multipliers (CDEM) are available for most mass spectrometers. The Burle Channeltrons® are made of a continuous strip glass dynode structure with a high resistance coating. The 4700 series multipliers were originally designed for mass spectrometer manufacturers and are currently used by Finnigan/Mat, DuPont, Hewlett-Packard, and others in the manufacture of their mass spectrometers. The 4700 series multiplier is a direct retrofit for existing CuBe multipliers in mass spectrometers and is rapidly becoming the standard detector in the industry due to its excellent air stability. The 4700 series models are designed to operate in the analog (current) mode. The 4800 series are designed to operate in either the analog or pulsed (digital) mode.

The normal life of multipliers is one or two years depending on the use (and abuse) of the mass spectrometer. Lives of over four years have been reported by users through careful use. The Burle multiplier in the Saturn space craft is expected to have a life of over eight years. Shelf-life of a Burle multiplier is expected to be at least two years if kept in its original sealed package or in a vacuum desicator until required for use. However, multiplier warranty is one year from the date of purchase.

All Burle multipliers for mass spectrometers are stocked by S.I.S. for emergency shipment to our customers avoiding unnecessary stocking by our customers. Multipliers can be shipped via UPS Ground, UPS Next Day, Federal Express or Airborne.

The Use of Channeltron® Detectors



The Channeltron® Electron Multiplier has a history of dependability in mass spectrometer applications. The following instructions and precautions are presented here in order that the user can achieve the maximum useful lifetime of a Channeltron detector.

1. Mounting work should be done in clean vacuum fashion, i.e., the detector should be handled with talc free finger cots or lint free gloves. Care should be taken to avoid dust, lint, or other particulate matter. Nothing should touch the active areas of the detector.

.2. Channeltrons are normally operated at pressures of 10^{-5} or lower. Higher pressure operation is observed to increase the background current and can result in shortened life. Do not apply high voltage at pressures greater than 10^{-4} torr as arcing can occur and permanent destruction of the Channeltron surface is possible.

3. Channeltrons are customarily operated at 1500 to 3000 volts. The maximum rated voltage difference between input and output leads is 3000 volts. Care should be taken to operate at a voltage which gives sufficient gain to achieve acceptable results. Higher gains will shorten Channeltron lifetimes in inverse proportion, i.e. 2x the gain results in 1/2 the potential lifetime.

4. During the first few days of operation of a new detector, it is recommended that high output currents be avoided (i.e.inputs above 10^{-9} amps while operating at gains in excess of 10^{7}). Taking this initial burn-in precaution can prevent premature failure.

5. Backstreaming from oil diffusion pumps or roughing pumps should not be permitted. It is recommended that cold traps and molecular sieve traps be operated and maintained to manufacturers specifications.

Warranty - All multipliers come with a **one year prorated warranty starting at the date of shipment.** Multipliers with insufficient gain or excessive noise should be returned to S.I.S. for evaluation and testing. If the multiplier proves to be defective due to manufacturing defects it will be replaced at no charge during the first three months of use and prorated thereafter based on a one year life and a gain of 1×10^{5} at 3 KV. Multipliers which test properly or which were damaged due to operator fault or carelessness will not be replaced, and user will be billed $180.00 for testing.

Channeltron® is a registered trademark of Burle Electro Optics Corp.

Contacting our Customer Service Department--comments, questions, or anything can't find?
Call/e-mail/FAX us, or type your comments below.

Name/organization:

Email: Phone/fax:

Send comments to SIS

Regular business hours are 8:00 AM to 5:30 PM EST, M-F.
E-mail replies are normally expected within one business day.
PHONE: (908)788-5550; **FAX:** (908)806-6631;
E-MAIL: us@sisweb.com **WEB:** www.sisweb.com

ADDRESS: Scientific Instrument Services, 1027 Old York Rd., Ringoes, NJ 08551.